

# MAGNETIZATION LOSSES IN HIGH TEMPERATURE SUPERCONDUCTING TAPES DUE TO AC AND DC MAGNETIC FIELDS

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In the work we present experimental results of AC magnetization losses minimization in HTSC tapes obtained by applying coaxial DC-bias magnetic field. At a certain magnetic field amplitude, and at a certain DC bias magnetic field, a distinguish minimum in AC losses is observed. Evolution of AC loss minimum curves differs considerably for two studied sample tapes. The HTSC tapes used in our experiments are commercially available composite tapes, namely BSCCO-2223/Ag multifilamentary tape and an YBCO-123 “coated conductor” tape. The AC magnetization losses were measured by means of an electric method, using Lock-in technique. The measurements were carried out with a sinusoidally varying magnetic fields at frequency range of about 11.5-63 Hz, and amplitudes up to 100 mT. The superimposed on the AC field, a bias DC field, was of the order of up to 50 mT. The source of the high homogeneous magnetic fields was a race-track coil supplied with two well electrically separated high power current sources: AC and DC ones. The magnetic fields were oriented perpendicular to the flat surface of the sample tapes, so parallel to the c-axes of HTSC material. All measurements were conducted at liquid nitrogen bath (77.3 K) and at a non-metallic cryostat. Presented experimental results are discussed on the base of existing theoretical models for energy dissipation in high temperature superconducting tapes.